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In re RONDIER, et al.

Reply to Office Action of February 11, 2008

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) Device A device for cooling power electronics (9),
comprising:

a support plate (21) on which the power electronics are mounted, said support plate comprising at least one orifice,

a ~~first~~ pressed metal plate including liquid circulation channels press-formed in said ~~first~~ pressed metal plate, said channels defining at least partially a cooling circuit for cooling the power electronics by circulation of a liquid in the channels;

an intermediate plate sandwiched between said support plate and said pressed metal plate; and

at least one manifold fixed to the intermediate plate and connected to the cooling circuit, said at least one manifold being introduced in said at least one orifice of the support plate.

~~wherein a cooling circuit (22) for cooling by circulation of a liquid is defined by said liquid circulation channels mounted directly or indirectly to the support plate, and~~

~~wherein the first pressed metal plate is smaller than the support plate when observed in a direction perpendicular to said plates.~~

2. (Currently amended) ~~Cooling~~ The cooling device according to claim 1, wherein the cooling circuit ~~(22)~~ comprises a liquid inlet channel ~~(29)~~, a liquid outlet channel ~~(30)~~ and said circulation channels ~~(28)~~ for the circulation of the liquid between the inlet channel and the outlet channel.

3. (Currently amended) ~~Cooling~~ The cooling device according to claim 2, wherein the cooling circuit comprises deflectors ~~(31)~~ situated in the liquid circulation channels.

4. (Currently amended) ~~Cooling~~ The cooling device according to claim 2, wherein the cooling circuit comprises turbulators ~~(32)~~ distributed in the liquid circulation channels.

5. (Canceled)

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Currently amended) ~~Cooling~~ The cooling device according to claim 1, ~~further comprising a metal~~ wherein the manifold (27) connected to the cooling circuit is made of

metal.

10. (Currently amended) ~~Cooling~~ The cooling device according to claim 1, wherein the first pressed metal plate is made of aluminum.

11. (Canceled)

12. (Currently amended) ~~Cooling~~ The cooling device according to claim 1, wherein the pressed metal plate (23) is fixed directly by brazing to the ~~support-plate (21)~~ intermediate plate.

13. (Currently amended) ~~Cooling~~ The cooling device according to claim 12, wherein at least one of the pressed metal plate (23) and the ~~support-plate (21)~~ intermediate plate comprises plating by co-lamination.

14. (Currently amended) ~~Cooling~~ The cooling device according to claim 13, wherein the pressed ~~and support-plates (21, 23)~~ metal plate and the intermediate plate are made from aluminum.

15. (Currently amended) ~~Cooling~~ The cooling device according to claim 9 1, wherein the ~~support-plate (21)~~ intermediate plate carries the manifold.

16. (Currently amended) ~~Method~~ A method of manufacturing a power electronics cooling device, comprising the steps of:

- producing a cooling circuit (22) by pressing a ~~first~~ metal plate (23) to integrally and homogenously form liquid circulation channels (28) in said ~~first~~ pressed metal plate,

- ~~providing producing at least one orifice through the first metal plate (23) and a support plate on which the power electronics are mounted, the support plate having at least one orifice,~~

- ~~- brazing the cooling circuit on said support plate (21) for the power electronics (9),~~

- ~~- brazing, on the cooling circuit, at least one manifold (27) for a cooling liquid to provide a closed-loop fluid-path connected to and delivering said cooling liquid to the manifold (27)~~

- ~~- brazing at least one manifold on an intermediate plate,~~

- ~~- mounting the support plate on the intermediate plate such that the manifold on the intermediate plate is introduced in the orifice of the support plate, and~~

- ~~- mounting the intermediate plate on the pressed metal plate such that the manifold is connected to the cooling circuit.~~

17. (Canceled)

18. (Currently amended) ~~Method~~ The method according to claim 16, wherein the

step of producing the cooling circuit by pressing of the ~~first~~ metal plate (23) comprises the pressing of deflectors (34) and/or turbulators (32) into the ~~first~~ metal plate (23).

19. (Currently amended) ~~Alternator~~ An alternator or alternator/starter for a motor vehicle, comprising a power electronics cooling device according to claim 1.

20. (Currently amended) ~~Cooling~~ The cooling device according to claim 3, wherein the cooling circuit further comprises turbulators (32) distributed in the liquid circulation channels.

21. (Canceled)

22. (Currently amended) ~~Device~~ A device for cooling power electronics (9), comprising:

a support plate (24) on which the power electronics are mounted, said support plate (24) being planar;

a ~~first metal~~ plate including ~~at least two liquid~~ circulation channels formed in said ~~first~~ metal plate; ~~said at least two circulation channels extending in different directions,~~

wherein a cooling circuit (22) for cooling by circulation of a liquid is defined by said liquid circulation channels,

wherein a plurality of deflectors are placed in the cooling circuit in order to guide the

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circulation of the liquid, and

~~wherein turbulators are configured in the cooling circuit in a junction of said two-~~
~~liquid circulations channels placed in the cooling circuit in order to accelerate the circulation~~
~~of the liquid, said turbulators being distributed between two deflectors along a fluid~~
~~circulation direction in the cooling circuit.~~

23. (Canceled)

24. (Canceled)

25. (New) The cooling device according to claim 1, wherein the intermediate plate is fixed directly by brazing to the support plate.

26. (New) The cooling device according to claim 25, wherein at least one of the intermediate plate and the support plate comprises plating by co-lamination.

27. (New) The cooling device according to claim 26, wherein the intermediate plate and the support plate are made of aluminum.